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Mazdoor Kisan Shakti Sangathan

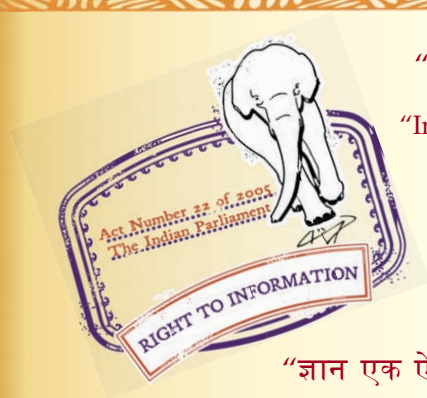
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Jawaharlal Nehru

“Step Out From the Old to the New”

IS 3705 (1980): Ball Point Pens [CHD 14: Printing, Inks, Stationary and Allied Products]



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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS : 3705 - 1980

Indian Standard
SPECIFICATION FOR
BALL POINT PENS
(*First Revision*)

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Indian Standard

SPECIFICATION FOR BALL POINT PENS (*First Revision*)

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SHRI K. K. CHARLA

SHRI B. R. CHARLA (*Alternate*)

Ambitious Gold Nib Mfg Co Pvt Ltd, New Delhi

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0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 September 1980, after the draft finalized by the Fountain Pens and Ball Point Pens Sectional Committee has been approved by the Consumer Products and Medical Instruments Division Council.

0.2 This standard was first published in 1966. A number of developments have taken place since then and also experience gained by the industry as well as the consumers during past years in the implementation of this standard has necessitated its revision.

0.3 Most of the plastics which are being used for the manufacture of fountain pens and ball point pens by the industry at present, have been found to be slow burning or self-extinguishing and not flame-resistant. Accordingly, the flame resistance test has been substituted with flammability test and a few types of plastics suiting this requirement have also been specified.

0.4 IS : 3707-1980* forms a necessary adjunct to this standard.

0.5 This standard contains clauses **6.1** and **8.1** which call for agreement between the purchaser and the supplier or permit the purchaser to use his option for selection to suit his requirements.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Specification for ball point pen refills (*first revision*).

†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard covers the requirements for single refill ball point pens, including desk type ball point pens.

2. MATERIAL

2.1 The materials used in the manufacture of ball point pens shall be either metal with suitable corrosion resistant finish or plastics or both. The plastics used shall be either cellulose acetate-butyrate or hard grade polypropylene or type 3 polystyrene conforming to IS : 2267-1972*. It shall satisfy the accelerated ageing test specified in 7.1 and the flammability test specified in 7.2.

2.1.1 Metal parts shall pass the corrosion test specified in 7.3.

2.1.2 The spring used shall be made of spring steel or phosphor bronze wire and shall pass the test specified in 7.4.

3. REQUIREMENTS

3.1 The length of the barrel of the ball point pen shall suit the length of the refill as well as the actuating mechanism so that the writing tip of the refill, when lowered, shall project not less than 2.5 mm and not more than 3.5 mm. The barrel shall preferably be of round shape, uniformly tapered and smoothly finished. It shall provide a comfortable finger grip.

3.2 The threads used in various mating parts shall be well formed and shall screw well. The mated parts shall not have any shake or play. The threads shall be interchangeable with parts of the same make and type.

3.3 The barrel, the cap, the actuating mechanism and the orifice for the writing tip shall all be concentric and well aligned.

3.4 When the refill is to be replaced, no part of the actuating mechanism except spring shall become disassembled and fall from the barrel of the cap.

3.5 The actuating mechanism shall be such that there shall be no failure in either clicking, refilling or retracting it. It shall pass the functional test specified in 7.5.

3.6 A pocket clip shall be suitably affixed with the cap of the pen. The tip of the clip shall be rounded smooth so that it does not tear the cloth when clipped in and out and shall have a reasonably tight grip. The pressure of the clip shall be such that when a smooth paper is inserted, the clip holds

*Specification for polystyrene moulding materials (*first revision*).

it firmly, but does not tear it. The clip shall neither rotate on its axis, nor shall it be loose when mounted. It shall pass the functional test specified in 7.6.

3.6.1 The provisions referring to actuating mechanism and the clip shall not be applicable to desk type ball point pens.

3.7 The refill used shall conform to IS : 3707-1980*. The ball point pen fully assembled (including the refill) shall be sound in every respect and shall pass the load test specified in 7.7.

3.8 All parts of the pens of same type and make shall be interchangeable.

4. FINISH

4.1 The finish of external surface shall be smooth, highly glossy and shall not have scratches, blisters, pits, sharp edges and other defects. The internal surface shall also be smooth and free from sharp edges, feathers and other defects. The clip shall be finished smooth and shall be plated suitably.

5. MARKING

5.1 The pen shall be marked with the manufacturer's name or initials or registered trade-mark on its barrel and cap.

5.1.1 The ball point pens may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. PACKING

6.1 Ball point pens shall be suitably packed in cartons or as agreed to between the manufacturer and the purchaser.

6.2 Each carton shall include instructions regarding precautions for preventing of catching fire.

*Specification for ball point pen refills (*first revision*).

7. TESTS

7.1 Accelerated Ageing Test — Ball point pens made of plastics material shall pass the accelerated ageing test when subjected to the temperature cycle as specified below:

<i>Time</i>	<i>Temperature</i>
4 h	0°C
4 h	50°C
4 h	0°C
4 h	50°C
7 days	27°C

7.2 Flammability Test — The specimens of the plastics parts of the ball point pens shall be prepared and tested in accordance with the method given in Appendix A. They shall be deemed to have passed the test if they are flame resistant, self-extinguishing or slow burning.

7.3 Corrosion Resistance Test — The metallic parts shall be subjected to a corrosion resistance test as follows:

The metal parts shall be dipped in a boiling 10 percent (*w/w*) aqueous solution of sodium chloride for a period of 15 minutes. After removal from this solution, they shall be immersed in a 10 percent aqueous solution of sodium chloride at room temperature, for one hour. They shall then be removed, wiped with a soft cloth and allowed to dry for 24 hours at room temperature. The metal parts shall not show any visible signs of corrosion.

7.4 Compression Test on Spring — Compress the spring fully and release it for 25 times. The spring shall show neither any permanent set nor lose its action.

7.5 Functional Test — Propel and retract the refill in the pen successively and quickly 50 times by operating the actuating mechanism. The pen shall function normally after the test and the actuating mechanism shall not be damaged.

7.6 Clip Action Test — Lift the clip, while affixed in the cap, to a distance of 4 mm from the surface of the cap and release it. The clip shall return to the initial position touching the surface of the cap. After the test is repeated 100 times, the clip shall hold a sheet of paper firmly without scratching it.

7.7 Load Test — When the ball point pen, fitted with its refill, is pressed for five minutes against a hard surface, such as a glass sheet, with a force of not more than 3 kgf (30 N approx) applied gradually at right

angles to the axis of the pen while holding the pen between 30 to 40 mm from the ball end and keeping it at an angle of 50° from the horizontal, the pen shall neither break nor its parts get disassembled.

8. SAMPLING

8.1 Unless otherwise agreed upon between the purchaser and the supplier, the sampling plan and criteria for conformity as given in Appendix B shall be followed.

APPENDIX A

(Clause 7.2)

TEST FOR FLAMMABILITY

A-0. GENERAL

A-0.1 Outline of the Method — The specimen is clamped in horizontal position. A flame is applied for 10 seconds and the specimen allowed to burn; the time taken for the edge of the flame to travel 100 mm is measured.

A-1. TEST SPECIMEN

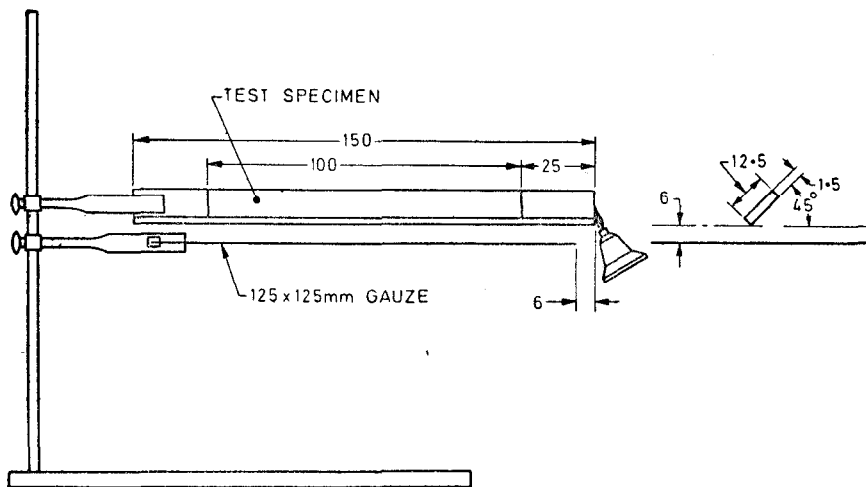
A-1.1 The specimen shall be $150 \times 12.5 \times 1.5$ mm. Two lines shall be drawn across the specimen one at 25 mm and the other at 125 mm from one end. At least three specimens shall be used.

A-2. PROCEDURE

A-2.1 The test is carried out in a draught-free atmosphere. It shall be clamped in a rigid support at one end so that its longitudinal axis is horizontal and its transverse axis is at 45° to the horizontal and the two lines are clearly visible. A piece of 125 mm square clean wire gauge is clamped in horizontal position 6 mm below the specimen with 6 mm of the unsupported end of the specimen projecting beyond the edge of the gauge as shown in Fig. 1.

An alcohol lamp (spirit lamp) with a non-luminous flame 12 to 20 mm in height shall be placed under the free end of the specimen so that the top of the flame just touches it. The flame shall be removed after 10 seconds and specimen allowed to burn. The time taken for the edge of the flame to travel the distance of 100 mm between the two lines shall be

measured with a stop-watch and the rate of burning of the specimen in millimetres per minute calculated therefrom. The rate of burning of the material shall be the arithmetic mean of the results obtained on three specimens. Any specimen which does not burn to the second mark shall be discarded and replaced. If three consecutive specimens do not burn to the second mark, the material shall be reported as resistant to flame propagation. If three specimens do not burn to the first mark and show no flame or after-glow 5 seconds after the burner has been removed, the material is deemed to be self-extinguishing. If the specimens continue to burn at a rate of less than 65 mm per minute, the material is slow burning.



All dimensions in millimetres.

FIG. 1 SPECIMEN UNDER TEST FOR RATE OF BURNING

APPENDIX B*(Clause 8.1)***SAMPLING SCHEME AND CRITERIA FOR CONFORMITY
FOR BALL POINT PENS****B-1. LOT**

B-1.1 In any consignment all the ball point pens manufactured from the same raw materials under relatively similar conditions of manufacture shall be grouped together to constitute a lot.

B-1.2 For ascertaining the conformity to the requirements of this standard, samples of pens shall be selected and tested separately for each lot.

B-2. SAMPLING

B-2.1 The number of pens to be selected at random from a lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 1.

TABLE 1 SAMPLE SIZE AND CRITERIA FOR CONFORMITY

LOT SIZE	FOR FINISH (4.1) and Requirements (3.1 to 3.8)		FOR TESTS FOR ACCELERATED AGEING (7.1), FLAMMABILITY (7.2), CORROSION RESISTANCE (7.3), COMPRESSION ON SPRING (7.4), FUNCTIONAL (7.5), CLIP ACTION (7.6) AND LOAD (7.7)	
	Sample Size	Acceptance Number	Sub-sample Size	Acceptance Number
(1)	(2)	(3)	(4)	(5)
Up to 150	32	2	5	0
151 „ 300	50	3	8	0
301 „ 500	80	5	10	0
501 „ 1 000	125	7	13	0
1 001 „ 3 000	200	10	15	1
3 001 and above	315	14	20	1

B-2.2 The pens in the sample shall be selected at random from the lot and to ensure the randomness of selection random number tables may be used. As a first step a suitable number of cartons (not less than 10 per cent of the total number in the lot subject to minimum of 5) shall be first chosen. An approximately equal number of pens shall be picked up from its different parts or layers so as to obtain the required number of pens.

B-3. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

B-3.1 The pens selected according to **B-2.1** and **B-2.2** shall be inspected for finish (**4.1**) and requirements (**3.1** to **3.8**). A pen failing in any one or both the requirements shall be considered as defective. The lot shall be considered as conforming to the requirements of the characteristics mentioned above if the number of defective pens in the sample does not exceed the number given in col 3 of Table 1.

B-3.2 The lot having been found conforming to **B-3.1** shall be tested for accelerated ageing test (**7.1**), flammability test (**7.2**), corrosion resistance test (**7.3**), compression test on springs (**7.4**), functional test (**7.5**), clip action test (**7.6**), and load test (**7.7**). For this purpose a sub-sample of size given in col 4 of Table 1 shall be taken from pens selected as in **B-2.1** and **B-2.2**. Each of the pens in the sub-sample shall be subjected to the tests mentioned above. A pen failing in anyone or more of the tests shall be considered as defective. The lot shall be considered as conforming to the requirements of the tests if the number of defectives in the sub-sample does not exceed the number given in col 5 of Table 1.